P-PB-024

IMPLANT THERAPY OUTCOMES, PERI-IMPLANT BIOLOGY ASPECTS

An in vivo and in vitro evaluation of a cetylpyridinium chloride(CPC), dipotassium glycyrrhizinate (Gk2), and tranexamic acid (TXA)-based mouthwash after implant placement.

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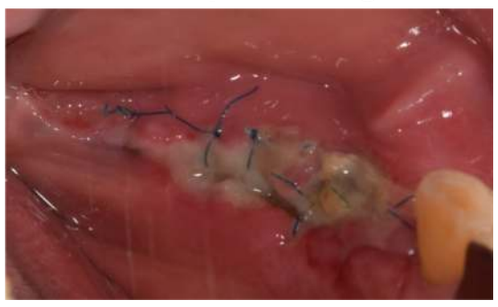
Abstract

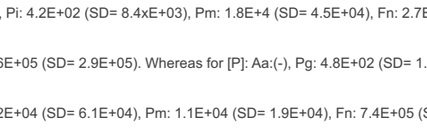
Plaque control in all implant treated patients is a sine qua non condition for treatment success. For this, multiple hygiene tools such as mouthwashes are available in the market as over-the-counter rinses to promote peri-implant health. Nevertheless, lots of questions remain unsolved in terms of real anti-microbial effectiveness, pro-healing benefits, and compatibility with implant materials. Therefore, more highly evidenced results are necessary in the field of peri-implant plaque control. To represent the first double-blinded randomized control trial to evaluate the positive effects of a CPC, Gk2, and TXA based mouthwash by laboratory techniques such as colony forming units (CFU) counting, polymerase chain reaction (PCR), and scanning electron microscopy (SEM). Sixteen patients planning to undergo posterior implant-placement surgery at the Tokyo Medical and Dental University Dental Hospital were randomly selected according to established exclusion and inclusion criteria. Patients gave their informed consent, and were divided in placebo group [P](n=8) and study group [S](n=8). After using the solution 3 times/day for 7 to 10 days, two 4-0 NYLON sutures were removed and culture and PCR of attached bacteria were performed. CFU were counted for total aerobic (TA), total staphylococci (TS), total G[-] anaerobic (TGNA), total enterobacteria (TE) and total a-heamophillus(Ta). Invitro resistance of MRSA and E.coli was analyzed.A.actinomycetemcomitans (Aa), P.gingivalis (Pg), T.forsythia(Tf), T.denticola (Td), P. intermedia (Pi), P.micra (Pm), F.nucleatum (Fn), C.rectus (Cr), E.corrodens (Ec) were analyzed by PCR. Compatibility of the mouthwash with Straumann® SLA® implants surface was analyzed by SEM at 5000x and 1000x after 48 hours of immersion.CFU averages for [S] were as follows: TA: 9.3E+04 CFU/ml (SD= 2.9); TS: 3.5 CFU/ml (SD= 11); TGNG: 4.7E+03 CFU/ml (SD= 3.9); TE: 7.2E+04 CFU/ml (SD= 5.1); Ta: 4.5E+04 CFU/ml (SD= 3.4). Whereas for [P]; TA: 1.5E+06 CFU/ml (SD= 3.2); TS:(-); TGNA: 1.7E+05 CFU/ml (SD= 4.5); TE: 5E+05 CFU/ml (SD= 2); Ta: 1.4E+05 CFU/ml (SD= 5.8). Except for TS, all bacteria were significantly higher in [P] than in [S] (p<0.05). In vitro resistance was (-) for MRSA, and slightly (+) for E. coli, with higher CFU for the placebo solution (p<0.05). PCR results for [S] were as follows: Aa, Pg, Tf, Td: (-), Pi: 4.2E+02 (SD= 8.4xE+03), Pm: 1.8E+4 (SD= 4.5E+04), Fn: 2.7E+05 (SD= 3.7E+05), Cr: 1.6E+05 (SD= 4.5E+05), Ec: 1.6E+05 (SD= 2.9E+05). Whereas for [P]: Aa:(-), Pg: 4.8E+02 (SD= 1.3E+03), Tf: 5.2E+03 (SD= 1.1E+04), Td: (-), Pi: 3.2E+04 (SD= 6.1E+04), Pm: 1.1E+04 (SD= 1.9E+04), Fn: 7.4E+05 (SD= 1.3E+06), Cr: 3.7E+05 (SD= 7.1E+05), Ec: 4.6E+05 (SD= 8E+05). SEM images showed no surface alteration after immersion. The bacterial amount in the placebo group was significantly higher for almost all species, especially for the TGNG. In vitro results showed that MRSA and E.coli are susceptible to a CPC, Gk2, and TXA based mouthwash. These results prove the positive effects of this mouthwash and encourages its use as a part of patient's oral hygiene routine. Since neither corrosion nor any other implant surface modification were observed, this type of mouthwash can be recommended for implant-treated patients.

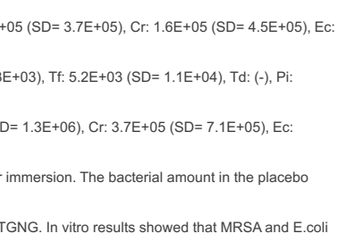
Background and Aim

Necrotic and infected post-surgical tissues



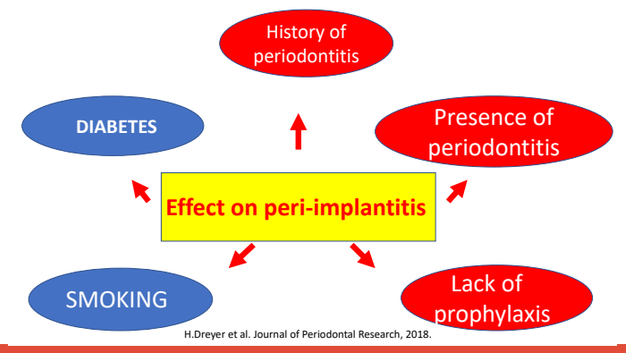
CPC: Bactericide



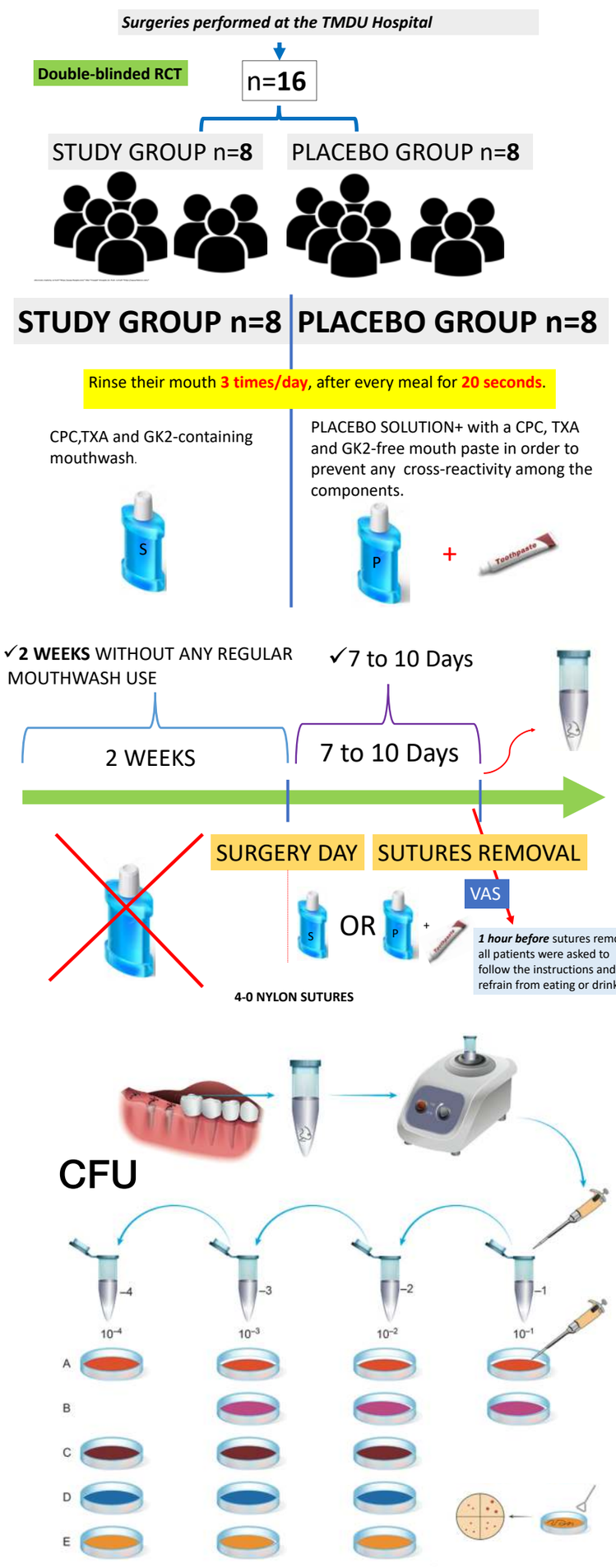


Dipotassium glycyrrhizate (GK2): anti-inflammatory agent.

Tranexamic acid (**TXA**): anti-hemorrhagic agent.



Methods and Materials



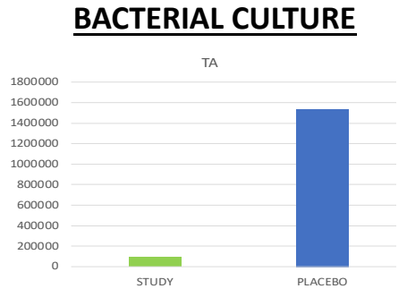
Bacteria analyzed by PCR in all the samples.

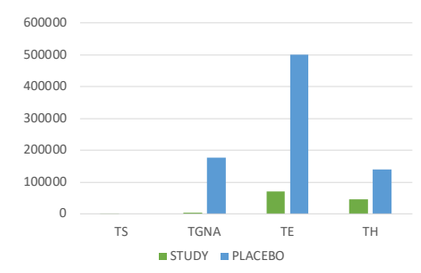
- A.actinomycetemcomitans (Aa)
- P.gingivalis (Pg)
- Tanerella forsythia(Tf)
- T.denticola (Td)
- P. intermedia (Pi)
- Parvimonas micra (Pm)
- F.nucleatum (Fn)
- Campylobacter rectus (Cr)
- Eikenella corrodens (Ec)

COMPATIBILITY OF CPC, Gk2, TXA WITH IMPLANT SURFACE.

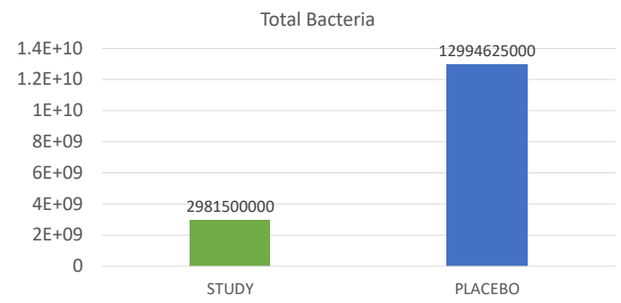
Results

BACTERIAL CULTURE





Total Bacteria analyzed by PCR



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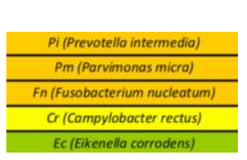

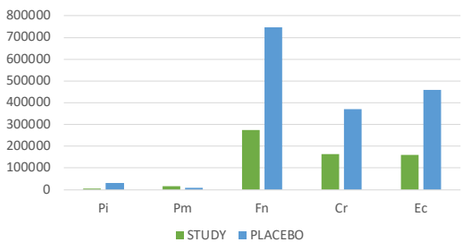

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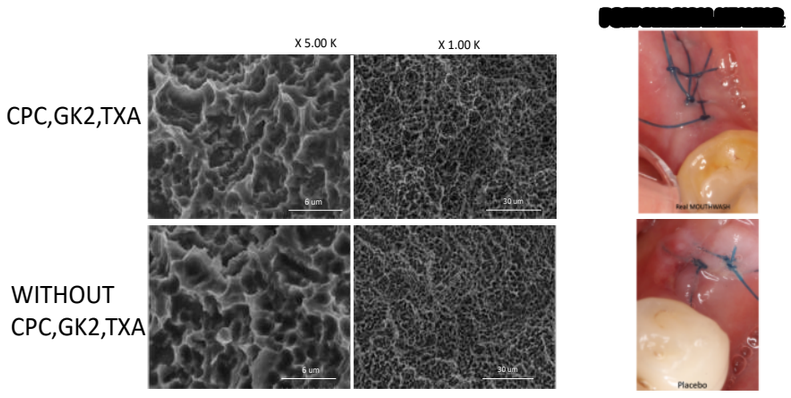

Conclusion

1.These results prove the positive effects of this mouthwash and encourages its use as a part of patient's oral hygiene routine.

2. Since there was no alteration on the implant surface, its use could be recommended to implant-treated patients.

References

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